

REMARKS

This communication is a full and timely response to the final Office Action dated June 29, 2005 (20050615). By this communication, claims 2, 5, 6, 8, 9, 10, and 11 have been amended.

Each of claims 2 and 10 have been amended to recite that the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. Support for the subject matter added to claims 2, 5, 6, 8, 9, and 10 can be found variously throughout the specification and drawings, for example, at page 7, line 19 through page 8, line 8 and in Fig. 3B elements 4, 10, and 13. No new matter has been added.

Each of claims 5, 6, 8, and 9 have been amended to recite that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. Support for the subject matter added to claims 5, 6, 8, and 9 can be found variously throughout the specification and drawings, for example, at page 7, line 19 through page 8, line 8 and in Fig. 3B elements 4, 10, and 13. No new matter has been added.

Claim 11 has been amended to improve form. No new matter has been added.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) satisfies a requirement of form asserted in the previous Office Action; and (c) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this amendment is respectfully requested. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

Claims 2 and 4-11 are pending where claims 2, 5, 6, 8, 9, and 10 are independent.

Claim Objections

Claim 11 was objected to for an informality. Applicant has amended claim 11 to change "claim 1" to "claim 10." Accordingly, the objection to claim 11 is moot and should be withdrawn.

Rejections Under 35 U.S.C. §103

Claims 2, 10, and 11 were rejected under 35 U.S.C. §103(a) as unpatentable over *Kazuto*—EP 11191865 and *Majumdar et al.*—U.S. Patent No. 6,187,522. Applicant respectfully traverses this rejection.

Claim 2 recites a camera system having a camera module comprising a flexible substrate provided with a through-hole for light transmission; an imaging element having a light receiving portion, wherein said imaging element is flip chip mounted on a first side of the substrate such that the light receiving portion is exposed through the through-hole; and a lens unit mounted on a second side of the substrate to cover a space over the light receiving portion of the imaging element, wherein the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Claim 10 recites an optical system having an optical module, said optical module comprising a flexible substrate provided with a through-hole; an optical element having an optical portion that is flip chip mounted on a first side of the flexible substrate such that the optical portion is exposed through the through-hole; a lens unit mounted on a second side of the substrate to cover a space over the optical portion of the optical element; and a system module connected to the flexible substrate in the optical module, wherein integrated circuits are mounted on the system module, wherein the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Each of claims 2 and 10 recite that the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. The metal plate serves to mechanically reinforce the mounting portion and secure the positioning accuracy of the lens unit in the optical axis direction when mounting the imaging element and the lens unit on the substrate. *See page 8, lines 19-23.*

Kazuto discloses an image pickup element having a CCD chip with a light receiving face, and an optical system including a lens that forms light incident onto the CCD chip 12 and an optical filter. The pickup element is mounted into an opening of a printed circuit board. The Office Action acknowledges that *Kazuto* fails to disclose teach or suggest the use a flexible wiring substrate and relies on *Majumdar* to remedy this deficiency. In addition, Applicant respectfully submits that *Kazuto* further fails to disclose, teach, or suggest at least that the

flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Majumdar discloses that all imaging products are based on flexible substrates for ease of transport, conveyance, and manufacturing. *Majumdar*, however, fails to disclose, teach, or suggest at least that the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

In summary, *Kazuto* and *Majumdar* either singly or combined fail to disclose, teach, or suggest at least that the flexible substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. At best, the combined references teach that flexible substrates are generally associated with imaging products. As a result, the teaching of the combined references cannot achieve the claimed results. Accordingly, a *prima facie* case for obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness “cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination.” *ACS Hosp. Sys. V. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). For at least the above reasons, Applicant respectfully requests that the rejection of claims 1 and 10 under 35 U.S.C. §103 be withdrawn, and these claims be allowed.

Claim 11 depends from claim 10. By virtue of this dependency, Applicant submits that claim 11 is allowable for at least the same reasons given above with respect to claim 10. In addition, Applicant submits that claim 11 is further distinguished over *Kazuto* and *Majumdar* by the additional elements recited therein, and particularly with respect to the claimed combination. Applicant respectfully requests, therefore, that the rejection of claim 11 under 35 U.S.C. §103 be withdrawn, and this claim be allowed.

Claims 5-9 were rejected under 35 U.S.C. §103(a) as unpatentable over *Kazuto* in view of *Sako et al.*—U.S. Patent No. 6,724,503. Applicant respectfully traverses this rejection.

Claim 5 recites an imaging device comprising a substrate; and an imaging element having a light receiving portion on a first side, and a shielding layer on a second side that is opposite the first side, wherein said imaging element is flip chip mounted on the substrate such

that said first side is opposed to the substrate, wherein the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Claim 6 recites an imaging device comprising a substrate having a through-hole for light transmission; and an imaging element having a light receiving portion on a first surface, wherein said imaging element is flip chip mounted on one side of the substrate such that the light receiving portion is exposed through the through-hole; and a shielding layer on a back surface of the imaging element, wherein said back surface is opposite to the first surface of the imaging element having the light receiving portion, wherein the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Claim 8 recites a camera module comprising a substrate having a through-hole for light transmission; an imaging element having a light receiving portion on a first surface of the imaging element and a shielding layer on a back surface of the imaging element, wherein said imaging element is flip chip mounted on a first side of the substrate such that the light receiving portion is exposed through the through-hole; and a lens unit mounted on a second side of the substrate, wherein the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Claim 9 recites a camera system using a camera module comprising a substrate having a through-hole for light transmission; an imaging element having a light receiving portion on a first surface of the imaging element and a shielding layer on a back surface of the imaging element, wherein said imaging element is flip chip mounted on a first side of the substrate such that the light receiving portion is exposed through the through-hole; and a lens unit is mounted on a second side of the , wherein the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

In summary, each of independent claims 5, 6, 8, and 9 recite that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. The metal plate serves to mechanically reinforce the mounting portion and secure the positioning accuracy of the lens unit in the optical axis direction when mounting the imaging element and the lens unit on the substrate. *See page 8, lines 19-23.*

The Office Action acknowledges that *Kazuto* fails to disclose, teach, or suggest at least a shielding layer on a back surface of the imaging element. In addition, Applicant respectfully submits that *Kazuto* also fails to disclose, teach, or suggest at least that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

Sako discloses an image sensor having a casing (4), a light source disposed in the casing (4) for emitting light toward an object (K) to be read, and an image sensor board (6) provided, on an obverse surface thereof, with a plurality of light receiving elements (52) for generating image signals upon receiving light reflected by the object (K). The image sensor board (6) is disposed so that the obverse surface thereof is directed inwardly of the casing (4). The substrate (6) is provided with a light shielding layer (61) for covering the reverse surface of the substrate at least entirely over a portion of the obverse surface where the plurality of light receiving elements (52) are mounted, so that disturbing external light is prevented from entering inside the casing (4). *Sako*, however, fails to disclose, teach, or suggest at least that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board.

In summary, *Kazuto* and *Sako* either singly or combined, fail to disclose, teach, or suggest at least that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. In another rejection, the Office Action applied *Majumdar* for the teaching of a flexible substrate. However, *Majumdar* fails to disclose, teach, or suggest at least that the substrate includes a flexible wiring board and a metal plate affixed to an end portion of the flexible wiring board. Thus, even a combination of *Kazuto*, *Sako*, and *Majumdar* would fail to disclose, teach, or suggest all the elements recited in claims 5, 6, 8, and 9. As a result, the teaching of the combined references cannot achieve the claimed results. Accordingly, a *prima facie* case for obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness “cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination.” ACS Hosp. Sys. V. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). For at least the above reasons, Applicant respectfully requests that the rejection of claims 5, 6, 8, and 9 under 35 U.S.C. §103 be withdrawn, and these claims be allowed.

Claim 7 depends from claim 5. By virtue of this dependency, Applicant submits that claim 7 is allowable for at least the same reasons given above with respect to claim 5. In addition, Applicant submits that claim 7 is further distinguished over *Kazuto* and *Sako* by the additional elements recited therein, and particularly with respect to the claimed combination.

Applicant respectfully requests, therefore, that the rejection of claim 7 under 35 U.S.C. §103 be withdrawn, and this claim be allowed.

Claim 4 was rejected under 35 U.S.C. §103(a) as unpatentable over *Kazuto* in view of *Majumdar* and further in view of *Sako*.

Claim 4 depends from claim 2. By virtue of this dependency, Applicant submits that claim 4 is allowable for at least the same reasons given above with respect to claim 2. In addition, Applicant submits that claim 4 is further distinguished over *Kazuto*, *Majumdar*, and *Sako* by the additional elements recited therein, and particularly with respect to the claimed combination. Applicant respectfully requests, therefore, that the rejection of claim 4 under 35 U.S.C. §103 be withdrawn, and this claim be allowed.

Conclusion

Based on at least the foregoing amendments and remarks, Applicants submit that claims 2 and 4-11 are allowable, and this application is in condition for allowance. Accordingly, Applicants request favorable reexamination and reconsideration of the application. In the event the Examiner has any comments or suggestions for placing the application in even better form, Applicants request that the Examiner contact the undersigned attorney at the number listed below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SON-1894 from which the undersigned is authorized to draw.

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Respectfully submitted,

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